PRE-REHABILITATION PLAN
Hog Canyon (Hog) Lake and associated waters (Spokane County)

I. PROPOSAL

A. Justification for Proposed Rehabilitation

Hog Canyon Lake has been a popular winter opener trout fishery in the Cheney/Sprague, WA area. This lake is one of two winter opener trout fisheries in the Cheney/Sprague area. Both of the winter opener lakes are currently overrun with competitive species that are limiting their trout production.

Repeated illegal introductions of undesirable fish species have plagued trout production on this lake for the past 30 plus years. Most recently the unwanted expansion of brown bullhead and tench are contributing to limit the productivity of the current trout fishery. Brown bullhead can be difficult to eradicate and have been present in the past three rehabilitations of this lake. In the 2003 rehabilitation tench were not present. Their presence at this time is likely due to high water in Spring 2008 that entrained them in from the upper basin. Through the use of rotenone to rehabilitate the lake, it is anticipated that this lake will return to a productive trout fishery.

B. Physical Description of Water Proposed for Rehabilitation

l. WATER: **Hog Canyon (Hog) Lake and associated waters**
2. LOCATION: Sections 19, 20, 29, 30, 31, Township 22 North, Range 40 East WM; 10 miles northeast of Sprague, in Spokane County
3. SURFACE ACRES OF LAKE: 44.5 MAXIMUM DEPTH: 13ft
4. VOLUME: 239 acre-feet; 649,603,434 lbs H_2O in lake. ~60 acre-feet; 163,198,000 lbs H_2O in associated waters
5. OUTLET: Yes, Hog Canyon Creek is the outlet stream. This stream is not a perennial stream, rather a series of interconnected beaver ponds and wetlands between Hog Canyon and Fishtrap Lakes. This stream flows during spring months but will be dry, except for the wetland portion, during the time of treatment. This portion of water will be treated as a part of the Hog Canyon rehabilitation and will be treated with rotenone at a rate of ~ 3.5ppm.
6. STREAM: Yes, will be dry at the time of treatment
7. PUBLIC ACCESS: Yes
8. LAND OWNERSHIP: PUBLIC = 45% (WDFW and BLM), PRIVATE 55%
9. ESTABLISHED RESORTS: None

C. Proposed Management Actions

1. WATER: **Hog Canyon Lake**
2. TARGET SPECIES: brown bullhead, tench, pumpkinseed sunfish, yellow perch
3. DATE LAST REHABED: October 2003
4. PROPOSED TREATMENT DATE: September-November, 2009
5. REPLANTING DATE: Spring 2010
6. SPECIES: rainbow trout
7. CATCHABLES: 10,000 rainbow FINGERLINGS: 25,000 rainbow
8. PROPOSED TOXICANT: Rotenone, powder and liquid CONCENTRATION: 3.2 ppm
   AMOUNT (ROTENONE AT 5% ACT. INGRED): 1,935 lbs powder and 15 gal. liquid in

lake; 75 gallons liquid in associated waters.
9. METHOD OF APPLICATION: pumper boat slurry and airboat spray at lake; helicopter spray for associated waters.
10. CREW DESCRIPTION: Leader(s) Chris Donley, Personnel ~ 4

II. PURPOSE:

The Washington Department of Fish and Wildlife (DFW) provides many types of fisheries in response to public desires. WDFW manages both trout and warmwater recreational fisheries based on many different species of fish and levels of difficulty. Public demand for and participation in production trout fisheries is high. These fisheries are prized as opportunities for families to recreate together, as well as providing an appropriate challenge for occasional or novice anglers. Winter Lakes trout fisheries provide a relaxed recreational opportunity, give anglers outdoor opportunity during the winter months, and are also integral to state and local economies.

Alternatives to rehabilitation are costly or impractical. To maintain a comparable fingerling-stocked trout fishery in these waters with catchable-sized fish would take 35,000 catchable rainbow. Stocking catchable sized fish costs almost ten times the cost of a fry plant, and Region One lacks the hatchery space and water to institute a catchable fish-stocking program as a substitute for lake rehabilitation. Spring fry survival in lakes free of competing species ranges from 50-80 percent. Regardless of fish size at stocking, interspecific competition with warmwater fishes limits fish growth and condition significantly. Ultimately, trout recruitment and fish quality lead to an undesirable trout fishery.

III. INTENDED OUTCOME/MEASURE OF SUCCESS:

WDFW intends to restore Hog Canyon Lake to a popular, easily accessible trout fishery based on fingerling-stocked trout. The average catch rates should be 3 to 5 fish/angler on the opener with a sustained harvest of 2 to 3 fish/angler for the duration of the season. Spring fry should be a minimum of 9 inches, and carryover harvest should be 15 to 20 percent of the overall harvest. Success will be measured during Opening Day and random creel contacts and biological surveys. Given a reasonable chance of reducing the populations of undesirable species dramatically, the beneficial effects should last approximately 6 to 8 years under current management schemes. In addition to reasons listed under Resource, Recreational and Economic Impacts, to abandon this lake as a trout fishery is to invite other incursions across the state in trout only managed lakes.

IV. RESOURCE IMPACTS:

1. The population of the target species, brown bullhead and tench, will be severely and negatively impacted. The aforementioned species are an exotic species that is not desired for a fishery under the current lake management plan.

2. Regional Lands, Habitat, Wildlife and Non-Game managers have been appraised of our rehabilitation plans. No unmitigated concerns have been expressed on the potential impacts to non-targeted species.

3. According to Bradbury (1986), the effects of rotenone on benthos are variable, depending on

the concentrations and species. Crustaceans are most tolerant while the smaller insects are most affected. Immediate reduction of populations averages 25%, and survival doubles when access to bottom sediments exists. Benthic communities generally recover to at least pretreatment levels within two months. Zooplankton is more severely impacted, and communities generally take two to twelve months to fully recover. While relatively tolerant of even heavy doses of rotenone, amphibians (especially larval) are at risk, and herptiles are affected somewhat less so. Almost no chance of eliminating an entire population exists.

4. During treatment the lake will be closed to angling, and other recreational uses such as boating, and swimming will be curtailed during the planned period of treatment.
There will be no loss of a fishery associated with our activities. Fishtrap Lake will be stocked to provide a fishery with catchable sized rainbow trout in the spring of 2009 prior to the Lowland Lakes Opening Day.

5. Professional biologists and other naturalists have visited these sites frequently over the past 40 years. To our knowledge, no endemic, rare, threatened or otherwise listed species will be impacted by the rehabilitation.

V. MITIGATING FOR ADVERSE IMPACTS:

1. Trout fry survival and growth for the proposed water will be greatly enhanced, and the future trout fishery will attain the previous status. No removal of dead fish is planned as the nutrient base contained therein is best returned to the lake.

2. Fall rehabilitation will not interfere with waterfowl spring nesting. The eradication of the undesirable fishes will also benefit waterfowl through increased production of invertebrates. Stocked populations of trout will not be anywhere near as numerous as the current undesirable fish population.

3. Livestock use of the waters to be treated will not be significantly affected. The concentration of rotenone used in the treatment will be far below that considered harmful to mammals. The landowners will be notified of the rehabilitation and consequent exposure of livestock to rotenone.

4. No endemic, rare, threatened or otherwise listed species are known to inhabit this area.

5. Protective wear for the eyes, face and hands will be available for all purveyors of rotenone.

6. Lakes will be posted according to Department of Ecology guidelines to notify the public of the treatment and discourage the public from possessing or consuming dead fish.

VI. RECREATIONAL IMPACT:

See Section III.

Angler success should reach 3-5 fish/angler on the opener and 2-3 fish/angler sustained harvest for the duration of the season. Yearling trout should average about 11 inches. Carryovers should be expected to be about 10 to 15 percent of the catch and average 13 inches for 2-year-olds and 16 inches for 3-year-olds.

VII. ECONOMIC IMPACTS:

An estimated minimum of 5,000 trips annually will be made to Hog Canyon Lake as a result of the proposed management action would result in an increased economic impact totaling $189,500 per year (1991 dollars; based WDW estimate of $37.90 per trip). If the project is successful for 10 years it will generate a minimum of $1,895,000 in economic activity. The total annual cost to plant these lakes with rainbow trout is less than $7,500. The rehabilitation will cost the Department about $50,000 (including costs of rotenone, time, travel). The investment by the state is realized in economic activity within 1 year following treatment.

Estimates for the cost of the enforcement action necessary to curtail the activity of the individuals responsible for illegal fish plants are not available. However, this cost might be looked upon as a statewide expenditure since some preventive benefit would certainly occur as perpetrators find out the Department takes illegal transport and planting of fish very seriously.

VIII. RELATED MANAGEMENT ACTION:

See I.C.6. for fish planting data

Increased penalties and enforcement activities are desirable if WDFW is ever going to dissuade illegal stocking of state managed waters. Educating the public about the costs in Department dollars and time with emphasis on what WDFW might be able to accomplish with those resources would be a very worthwhile activity for O & E. This may result in stemming recruitment to this ill advised group and turning local opinion against the offenders.

IX. PUBLIC CONTACT:

Public meetings will be held during July 2009 in Ephrata, Spokane, Colville and Olympia to explain WDFW's 2009-10 rehabilitation proposals, assess public opinion, and address local concerns.

Initiated by: Region One, District 2 Fisheries Management